Overview Checkpoint

Question (1)

A graduate student designs a research study. She hopes to show that the results of her experiment are statistically significant. What type of P-value indicates statistically significant results?

A: A large P-value.

B: A small P-value.

C: The magnitude of a P-value. has no impact on statistical significance.

Feedback

A : 0

✗ Incorrect: A large P-value means that the results are not statistically significant. The correct answer is (B).

B : 10

✓ Good job! A small P-value indicates that the results are statistically significant.

C : 0

✗ Incorrect: A small P-value indicates that the results are statistically significant. The correct answer is (B).

Question (2)

The makers of Mini-Oats cereal have an automated packaging machine that is set to fill boxes with 24 ounces of cereal. At

various times in the packaging process, we select a random sample of 100 boxes to see if the machine is filling the boxes with an average of 24 ounces of cereal. Which of the following is a statement of the null hypothesis?

Which of the following is a statement of the null hypothesis?

A: The machine fills the boxes with the proper amount of cereal. The average is 24 ounces.
B: The machine is not filling the boxes with the proper amount of cereal. The average is not 24 ounces.
C: The machine is not putting enough cereal in the boxes. The average is less than 24 ounces.

Feedback

A : 10

✔ Good job! We assume the machines are filling correctly and then see if the sample provides evidence otherwise. So H_0 is that $\mu = 24$ ounces.

B : 0

✘ Incorrect: We assume the machines are filling correctly and then see if the sample provides evidence otherwise. So H_0 is that $\mu = 24$ ounces. The correct answer is (A).

C : 0

✘ Incorrect: We assume the machines are filling correctly and then see if the sample provides evidence otherwise. So H_0 is that $\mu = 24$ ounces. The correct answer is (A).

Question (3)

The makers of Mini-Oats cereal have an automated packaging machine that is set to fill boxes with 24 ounces of cereal. At various times in the packaging process, we select a random

sample of 100 boxes to see if the machine is filling the boxes with an average of 24 ounces of cereal.

Which of the following is a statement of the alternative hypothesis?

A: The machine fills the boxes with the proper amount of cereal. The average is 24 ounces.
B: The machine fills the boxes with the proper amount of cereal. The average is less than 24 ounces.
C: The machine is not filling the boxes with the proper amount of cereal. The average is not 24 ounces.

Feedback

A : 0

✗ Incorrect: The alternative hypothesis always suggests some type of difference, although the scenario does not suggest that it would be either greater or lesser than 24 ounces. Therefore, the H_a is that $\mu \neq 24$ ounces. The correct answer is (C).

B : 0

✗ Incorrect: The alternative hypothesis always suggests some type of difference, although the scenario does not suggest that it would be either greater or lesser than 24 ounces. Therefore, the H_a is that $\mu \neq 24$ ounces. The correct answer is (C).

C : 10

✓ Good job! The alternative hypothesis is that the machines are not filling the boxes correctly although the scenario does not suggest that it would be either greater or lesser than 24 ounces. Therefore, the H_a is that $\mu \neq 24$ ounces.

Question (4)

A tire manufacturer has a 60,000 mile warranty for tread life. The manufacturer considers the overall tire quality to be acceptable if less than 8% are worn out at 60,000 miles.

The manufacturer tests 250 tires that have been used for 60,000 miles. They find that 15 of them are worn out. With this data, we test the following hypotheses at the 5% significance level.

H_0: The proportion of tires that are worn out after 60,000 miles is equal to 0.08.

H_a: The proportion of tires that are worn out after 60,000 miles is less than 0.08.

The P-value is 0.15. Which conclusion is correct?

A: Accept H_0.
B: Fail to reject H_0.
C: Reject H_0.

Feedback

A : 0

✗ Not quite right: You are correct that we cannot reject H_0 since the P-value is greater than the significance level. (0.15 > 0.05) But this does not mean that H_0 is true. We say that we â€œfail to rejectâ€ H_0. The correct answer is (B).

B : 10

✓ Good job! The P-value is greater than the significance level. (0.15 > 0.05) So we â€œfail to rejectâ€ H_0.

C : 0

✗ Incorrect: The P-value is greater than the significance level. (0.15 > 0.05) So we â€œfail to rejectâ€ H_0.

Question (5)

The following are the steps in the process of hypothesis testing.

A. Conclusion

B. Assessment of Evidence

C. Stating the Claims

D. Choosing a Sample and Collecting Data

A: C,D,B,A
B: D,C,B,A
C: D,C,B,A
D: C,D,B,A

Feedback

A : 0

✗ Incorrect. The steps of hypothesis testing, in order, are: Stating the Claims, Choosing a Sample and Collecting Data, Assessment of the Evidence, and Conclusion. Therefore, the correct answer is (D).

B : 0

✗ Incorrect. The steps of hypothesis testing, in order, are: Stating the Claims, Choosing a Sample and Collecting Data, Assessment of the Evidence, and Conclusion. Therefore, the correct answer is (D).

C : 0

✗ Incorrect. The steps of hypothesis testing, in order, are: Stating the Claims, Choosing a Sample and Collecting Data, Assessment of the Evidence, and Conclusion. Therefore, the correct answer is (D).

D : 10

✓ Good job! The steps of hypothesis testing, in order, are: Stating the Claims, Choosing a Sample and Collecting Data, Assessment of the Evidence, and Conclusion.